

1 **MULTI-MEDIA PLAYER HAVING A ROTATABLE PANEL THAT**
2 **CAN BE RESTORED AUTOMATICALLY**

3 **BACKGROUND OF THE INVENTION**

4 **1. Field of the Invention**

5 The present invention relates to a multi-media player, and more
6 particularly to a multi-media player having a rotatable panel that can be
7 restored automatically.

8 **2. Description of the Related Art**

9 A conventional multi-media player, such as a VCD or DVD player,
10 mounted on the computer comprises a main frame, a retractable tray movably
11 mounted in the main frame for carrying a portable storage medium, such as a
12 VCD or DVD, and a cover plate that is pivoted relative to the main frame to
13 cover or open the retractable tray. However, the cover plate is only used to
14 cover or open the retractable tray without having other additional functions,
15 thereby limiting the versatility of the cover plate. In addition, the cover plate is
16 not operated easily, thereby causing inconvenience to the user.

17 **SUMMARY OF THE INVENTION**

18 The present invention is to mitigate and/or obviate the disadvantage
19 of the conventional multi-media player.

20 The primary objective of the present invention is to provide a
21 multi-media player having a rotatable panel.

1 Another objective of the present invention is to provide a
2 multi-media player having a rotatable panel that can be restored automatically.

3 A further objective of the present invention is to provide a
4 multi-media player, wherein the rotatable panel has a rotatable function to
5 cover or detach from the receiving portion of the main frame.

6 In accordance with the present invention, there is provided a
7 multi-media player, comprising:

8 a main frame; and

9 a rotatable panel rotatably mounted on the main frame and including:

10 a mounting plate secured on the main frame and formed with a
11 window; and

12 a casing rotatably mounted on the mounting plate and rotatable
13 between a first position where the casing is rested on the mounting plate and a
14 second position where the casing is removed from the mounting plate to
15 expose the window of the mounting plate, wherein:

16 when the casing is moved from the first position to the second
17 position, the casing stores a restoring force to provide an automatic restoring
18 function.

19 Further benefits and advantages of the present invention will become
20 apparent after a careful reading of the detailed description with appropriate
21 reference to the accompanying drawings.

22 **BRIEF DESCRIPTION OF THE DRAWINGS**

1 Fig. 1 is a partially cut-away perspective view of a multi-media
2 player in accordance with the preferred embodiment of the present invention;

3 Fig. 2 is a schematic operational view of the multi-media player as
4 shown in Fig. 1;

5 Fig. 3 is an exploded perspective view of the multi-media player as
6 shown in Fig. 1;

7 Fig. 4 is an exploded perspective view of a restoring device of the
8 multi-media player in accordance with the preferred embodiment of the
9 present invention;

10 Fig. 5 is a partially front plan cross-sectional view of the multi-media
11 player as shown in Fig. 1;

12 Fig. 6 is a schematic operational view of the multi-media player as
13 shown in Fig. 5;

14 Fig. 7 is a partially side plan view of the multi-media player as shown
15 in Fig. 1;

16 Fig. 8 is a schematic operational view of the multi-media player as
17 shown in Fig. 7; and

18 Fig. 9 is a schematic operational view of the multi-media player as
19 shown in Fig. 8.

20 **DETAILED DESCRIPTION OF THE INVENTION**

21 Referring to the drawings and initially to Figs. 1-5, a multi-media
22 player, such as a VCD or DVD player, in accordance with the preferred

embodiment of the present invention comprises a main frame 1, and a rotatable panel 2 rotatably mounted on the main frame 1.

The main frame 1 is provided with a retractable receiving portion 10 for carrying a portable storage medium, such as a VCD or DVD. Preferably, the receiving portion 10 of the main frame 1 is a retractable tray.

The rotatable panel 2 includes a mounting plate 20 secured on the main frame 1, and a casing 30 rotatably mounted on the mounting plate 20.

The mounting plate 20 is formed with a window 21 aligning with the receiving portion 10 of the main frame 1 for passage of the receiving portion 10.

The casing 30 includes a first plate 31, a second plate 32 combined with the first plate 31, and an electronic device 33 mounted between the first plate 31 and the second plate 32.

The first plate 31 of the casing 30 is formed with a window 310.

The electronic device 33 includes a circuit board 330, an indicator 331, and two control switches 332.

The circuit board 330 is electrically connected to the main frame 1 to control operation of the multi-media player.

The indicator 331 is mounted on the circuit board 330 and is flush with the window 310 of the first plate 31. The indicator 331 is preferably a liquid crystal display (LCD) to indicate the operation condition of the multi-media player.

1 The first plate 31 is formed with two through holes 311 for mounting
2 the two control switches 332. Each of the two control switches 332 is mounted
3 on the circuit board 330. The two control switches 332 are preferably a volume
4 control button and a frequency modulation button to control the playing
5 functions of the multi-media player.

6 The casing 30 is rotatable between a first position where the second
7 plate 32 of the casing 30 is rested on the mounting plate 20 rigidly and stably as
8 shown in Fig. 1 and a second position where the second plate 32 of the casing
9 30 is removed from the mounting plate 20 to wholly expose the window 21 of
10 the mounting plate 20 as shown in Fig. 2.

11 In brief, the casing 30 forms an operation panel that can indicate the
12 operation condition of the multi-media player and can also control the playing
13 functions of the multi-media player. In addition, the casing 30 has a rotatable
14 function to cover or detach from the receiving portion 10 of the main frame 1.

15 The mounting plate 20 is formed with two opposite mounting
16 portions 22 each formed with a mounting recess 220. The rotatable panel 2
17 further includes two connecting portions 23 each secured on a respective one
18 of the two mounting portions 22 of the mounting plate 20 and each including a
19 first block 231 formed with a fixing hole 233, and a second block 232
20 integrally formed on the first block 231 and inserted into the mounting recess
21 220 of a respective one of the two mounting portions 22. The fixing holes 233

1 of the first blocks 231 of the two connecting portions 23 are co-axial with each
2 other.

3 The rotatable panel 2 further includes two restoring devices 4 each
4 mounted between the first plate 31 of the casing 30 and a respective one of the
5 two connecting portions 23 to provide a restoring effect to return the casing 30
6 to the original position.

7 The first plate 31 is formed with two opposite fixing members 312
8 each formed with a plurality of fixing recesses 3120. Each of the two restoring
9 devices 4 includes a shaft 41 fixed on a respective one of the two connecting
10 portions 23, a rotation barrel 40 secured on a respective one of the two fixing
11 members 312 of the first plate 31 and rotatably mounted on the shaft 41, and an
12 elastic member 42 mounted in the shaft 41 and urged between the rotation
13 barrel 40 and the shaft 41.

14 The shaft 41 has a distal end formed with a plug 415 protruded
15 outward from the fixing barrel 40 and fixed in the fixing hole 233 of a
16 respective one of the two connecting portions 23. The shaft 41 has an inside
17 formed with a chamber 410 for receiving the elastic member 42 and has a
18 periphery formed with a plurality of through holes 411 each communicating
19 with the chamber 410.

20 The rotation barrel 40 has a periphery formed with a plurality of
21 fixing blocks 401 each fixed in a respective one of the fixing recesses 3120 of

1 the respective fixing member 312 of the first plate 31. The rotation barrel 40 is
2 formed with an opening 403 for receiving the shaft 41.

3 The chamber 410 of the shaft 41 has an end face formed with a fixing
4 groove 412 (see Fig. 5). The opening 403 of the rotation barrel 40 has an end
5 face 402 formed with a fixing stud 404 formed with a fixing groove 405. The
6 elastic member 42 has a first end fixed in the fixing groove 412 of the shaft 41
7 and a second end fixed in the fixing groove 405 of the rotation barrel 40.

8 Each of the two restoring devices 4 further includes a viscous body
9 44 mounted between the rotation barrel 40 and the shaft 41, a cover 43 fixed in
10 the opening 403 of the rotation barrel 40 to rotate therewith and formed with a
11 through hole 430 for passage of the plug 415 of the shaft 41, and an O-ring 45
12 urged between the rotation barrel 40 and the shaft 41 to seal the viscous body
13 44. Preferably, the viscous body 44 is a greasy oil to provide a damping effect
14 between the rotation barrel 40 and the shaft 41.

15 The cover 43 has an inner wall formed with two opposite positioning
16 blocks 431, and the shaft 41 has a periphery formed with two opposite catch
17 blocks 413 to stop movement of the positioning blocks 431 of the cover 43 to
18 prevent the elastic member 42 from being distorted or deformed excessively
19 due to an excessive rotation of the rotation barrel 40.

20 In operation, when the casing 30 is rotated relative to the mounting
21 plate 20, the rotation barrel 40 is rotated on the shaft 41 to move from the
22 position as shown in Fig. 5 to the position as shown in Fig. 6, so that the elastic

1 member 42 is distorted during movement of the casing 30 to store a restoring
2 force.

3 As shown in Figs. 7-9 with reference to Figs. 1-6, when the casing 30
4 is located at the first position as shown in Fig. 7, the second plate 32 of the
5 casing 30 is rested on the mounting plate 20 rigidly and stably as shown in Fig.
6 1.

7 When the casing 30 is moved outward relative to the mounting plate
8 20 to move to the second position as shown in Fig. 9, the second plate 32 of the
9 casing 30 is removed from the mounting plate 20 to wholly expose the window
10 21 of the mounting plate 20, so that the receiving portion 10 of the main frame
11 1 is moved outward from the window 21 as shown in Figs. 2 and 9.

12 At this time, the elastic member 42 is distorted during movement of
13 the casing 30 to store a restoring force. Thus, when the receiving portion 10 of
14 the main frame 1 is retracted into the window 21 of the mounting plate 20, the
15 casing 30 is moved toward the mounting plate 20 by the restoring force of the
16 elastic member 42, so that the casing 30 is moved from the second position as
17 shown in Fig. 9 to the first position as shown in Fig. 7 to return to the original
18 state.

19 Although the invention has been explained in relation to its preferred
20 embodiment(s) as mentioned above, it is to be understood that many other
21 possible modifications and variations can be made without departing from the
22 scope of the present invention. It is, therefore, contemplated that the appended

1 claim or claims will cover such modifications and variations that fall within the
2 true scope of the invention.

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